



TRANSCRIPT

ENTERPRISE + STEM

DR JACQUELINE DOHANEY

STEM Education Lecturer

My name is Jackie Dohaney. I am a STEM education lecturer at Swinburne. I research how students learn science and engineering at university, and I'm currently teaching in the physics department, specifically first-year physics and astrobiology.

My father is an engineer and my grandfather was an air traffic controller, so I grew up around technology, I grew up around the outdoors.

One of my favourite teachers in high school was a math teacher and he had experience an industry working in maths, and I sort of didn't understand what was the purpose of math. I knew I had to do it, I knew it was a part of the science and engineering system, and he was just a really kind person. He recognised all of the students in his classroom, not just the men or the young men or the boys in the classroom. He was very 'equal' sort of 'opportunity' kind of teacher.

I was born in Canada and I grew up in Nova Scotia, East Coast Canada. My father's an engineer so he moved our family down to the States when I was a teenager, and so I went to high school in Massachusetts, in America. But subsequently, I went to college and university in Canada.

I studied in Ottawa for my first degree in geology, in Ottawa at Carleton University, and then I moved to Australia to work for the mining industry for a couple of years, and subsequently went on to do my Masters in Volcanology at the University of British Columbia in Vancouver, Canada.

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And then I got really excited about education and teaching and how we teach at university. So I did a PhD in geology education at the University of Canterbury in New Zealand. So this accent that you hear is a combination of Canadian and American and a little bit of Kiwi, and I've been fortunate enough to move to Melbourne and work at Swinburne University for the past four years.

I think that there's a lot of new ideas and innovations in gaming, and I think that there's a lot of opportunity there for children and students to get involved in exploring worlds (plural), and working with each other and asking questions and being curious. So I think it's an opportunity.

Some of the work I've done in 'serious gaming', some of the research I did in my PhD, was about how do we create authentic geographic environments, geothermal fields, volcanoes, in a video game and get students to interact with that as if they're imagining themselves being there in the field and being on the ground and doing science in real time. And so there are opportunities for that, but there needs to be investment. There needs to be money and resources supporting these sorts of endeavours. The small video game that we created took two years to create and a very small budget. It was a labour of love, but there's a lot of room for improvement in that space.

My current interests now, being a nerd, I love playing D&D. I love video games. That's an overlap with some of my science interests, and those are sort of treated almost separately. But in the end you're exploring worlds, you're being curious about how things work, you're working with other people, you're

getting excited about cool ideas, and that's really at the heart of what science is.

One of the best parts about being a scientist in academia is getting to do pretty much any day and every day differently. We still have meetings. I meet with students. We talk through their thoughts and ideas on physics and astrobiology. I help them sort of adjust their thinking. I help them understand some of the more difficult concepts.

The other part of my job, which is really important, is research.

I'm researching how students learn at university, and a lot of that research involves, again, speaking with students, asking them about how they're learning and what they're learning, and the kinds of challenges they have with that.

I write papers, I publish, so I also spend a lot of time speaking with my colleagues, mostly on the internet, working together, coming up with new ideas, publishing those ideas, working through the rigour of whether or not my ideas are scientifically accurate or not, and sharing that with the wider community – hoping that we can make advances in how students are learning, make it more accessible, make it more exciting, and make it more welcoming for people.

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There's so much interesting overlap between the creative arts gaming industry, entertainment, and science, and it's a place I think people are going, but I think that we can go further.

Experiencing what it is to work in science, to be in science via nature, to work on certain technical problems, and to be able to virtually create that, and experience that, and test that out on your own, and have these independent ideas and curiosities examined –through gaming – is a huge opportunity for students to get involved.

Everything we do in science and engineering has to, in my opinion, meet a public good. There has to be a good from what we're doing. And even the big blue sky ideas, the out of the box thinking, there can always be benefits that we bring back into society. For me, working collaboratively across these boundaries with my colleagues in education and philosophy and sociology in particular, we're thinking together and we're thinking differently, but we're coming up with new ideas that helps everybody across these sectors.

I think one of the key areas of opportunities for students in science, technology, engineering, and maths is to work around climate change. Our society has a really huge challenge to face over the next century, and we're going to need everyone to help us with that. And that challenge requires students to think innovatively – outside of the box – because our current technologies and our current ways of approaching this problem are not working.

We need people to come in with fresh ideas, abilities to think of new ways to fix our system, and help fix society as well. Because a lot of these problems are society driven. And that requires students to think creatively and to care about our environment and care about how our society is going to work in this space.

The main piece of advice I give to students when they're younger and thinking about investigating STEM as a possible career, is to simply not limit yourself to one or two options. I think if there's something that you're interested in, if you read about it, if you watch it on television, and you get really excited and it kind of lights a little fire in your heart, I think that you should try it. You should ask people about it.

For me, I was really interested in astronomy and I had colleagues at my school that we went out and I learned ... I went to a planetarium. None of that opportunity was in my house or in my family, I had to go out and find it. So I think if you're interested in it, if it's interesting to you even a little bit, you should try it.

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